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native mammals. Hence it is hardly surprising that in the structure of its body this animal exhibits marked differences from all the other habitants of the forest." Like the elephant, it forces its way through the thickets. It is consequently equipped with (1) a conical head; (2) short, powerful legs; (3) tough skin; (4) coat of bristles; (5) deep-set eyes. It lives in the marsh. The separating toes prevent sinking; the body is kept from cooling in the water by the thick layer of fat. The bristles dry quickly so that little heat is lost. The boar is omnivorous, hence such and such teeth, hearing, sight. It burrows, hence shape of head, snout, canine teeth, muscles of neck, spinous processes of cervical vertebrae, distribution. Finally the boar has certain relations to man.

This method is followed throughout the book. It is very illuminating. The great difficulty is that in the attempt to explain everything one cannot but feel that the author sometimes resorts to explanations that are merely possible and plausible.

On the whole, however, the book is to be strongly commended to the general reader and to the consideration of the teacher of zoology in secondary schools and colleges. This is the sort of zoology that is to be preferred to pure morphology as an introduction to the science. The selection of such heavy paper and large size of pages seems unfortunate for a text-book, for, because adding to the price of the book, they must restrict its use.

C. B. DAVENPORT.

Handbook on Sanitation. A Manual of Theoretical and Practical Sanitation. By GEORGE M. PRICE, M.D. New York, John Wiley & Sons; London, Chapman & Hall, Ltd. 1901. 12mo. Pp. xii+317; figs. 31. Cloth, \$1.50 net.

The book is of four parts, 'Sanitary Science,' 'Sanitary Practice,' 'Sanitary Inspection' and 'Sanitary Law.'

Part one is stated to be a 'condensed but comprehensive résumé of the best text-books.' It is vastly too condensed to be of use to 'students and physicians.' Thus the question of 'water and water-supply' is disposed of in

seven and a half pages, and nine and a half are given to 'sewage and sewage disposal.'

Carbon dioxide should not be classed as a 'virulent poison,' and the statement that carbon monoxide 'may produce death when inhaled in large amounts' does not do justice to the highly poisonous qualities of that gas.

On page 21 it is written that 'as a rule the height of a room ought to be about one third of the cubic space.'

The error of such an expression is apparent. Possibly the author had in mind the 'cube root' rather than 'one third.'

The chapters on plumbing are good and well illustrated.

Considerable information of value, such as tables of measurements, elementary mensuration, extracts from civil service rules, and tenement-house law, is included in the last half of the volume. As a whole, the book contains material useful to a certain class of inspectors, but it is an error to entitle it 'a manual of theoretical and practical sanitation.'

SCIENTIFIC JOURNALS AND ARTICLES.

The Botanical Gazette for May contains the following articles: The third and last part of the paper by Frederick C. Newcombe on 'The Rheotropism of Roots' appears, and the paper as a whole embodies important results from several years of experimentation. Mr. Newcombe's first paper upon the subject was read before the American Association in 1896. The detailed results of the numerous well-devised experiments cannot be given, but the conclusion of the whole matter may be summed up as follows: Rheotropism is an obscure phenomenon manifested in the curving of roots against a stream of water. The author finds the response not general among plants, there being but twenty sensitive species out of thirty-four tested. Velocities of flow causing a response may range from 0.1 cm. to 500 cm. per minute, though the strongest curves are formed in velocities between 100 cm. and 500 cm. per minute. A remarkable discovery was made in finding the roots sensitive not only at the apex and throughout the elongating zone, but for some distance

beyond the elongating zone. Rheotropism is not a transitory phenomenon, but persists in the maturing plant. It is perhaps a response to pressure, though terrestrial roots are not known to be sensitive to pressure. Kiichi Miyake writes 'On the Starch in Evergreen Leaves and its Relation to Photosynthesis during the Winter.' The work was carried on at the Tokyo Imperial University and the conclusions reached have to do with conditions in Japan. The starch in evergreen leaves in general begins to decrease in November, reaching its minimum during January, and increasing again from the end of February. During the winter many evergreen leaves contain starch, and this starch, as experiments showed, is formed by photosynthesis in winter and its translocation occurs in the same season. This phenomenon is true of middle and southern Japan, but in northern Japan most evergreen leaves lose their starch in winter. The opening of the stomata in winter was also observed in some evergreen leaves in Tokyo. James B. Overton describes 'Parthenogenesis in *Thalictrum purpurascens*.' Embryos were produced parthenogenetically under all artificial conditions, and wild material showed the phenomenon to be general in nature. The cytoplasm of the early stages of the sac is closely packed about the egg, which later becomes surrounded by a modified zone which may affect the osmotic pressure and indicate a withdrawal of water, causing the egg to divide. No differences could be detected in the development and vigor of normal and parthenogenetic embryos, except that the latter is slower in starting. *Thalictrum* is the third genus of angiosperms in which parthenogenesis has been recorded, the others being *Antennaria*, described by Juel, and *Alchemilla*, described by Murbeck. R. G. Leavitt describes some subterranean plants of *Epiphegus*, which were dwarf specimens, buried one or two inches deep, but with flowers and fruit in all stages of development. D. G. Fairchild, in continuing his 'Notes of Travel,' describes the bright-colored autumn foliage of American trees in Europe, special mention being made of *Quercus rubra* and

Acer dasycarpum. T. D. A. Cockerell describes a new *Heliotropium* from New Mexico.

THE May number of *Popular Astronomy* has two brief articles by J. E. Gore, of England; the one on 'Immensity and Minuteness' brings out the vastness of the numbers dealt with in astronomy, and contrasts them with the minuteness of atoms as revealed by the microscope. He cites as illustrations that the distance of the nearest fixed star is 271,000 times the distance of the sun, and the fact that certain forms of infusoria are so minute that an individual specimen can lie between two divisions of an inch divided into 25,000 parts. Mr. Gore's second article gives his new method of computing the value of starlight in terms of moonlight. William L. Hornsby, for some years a resident of China, writes from Macao of 'The Chinese Calendar.' He finds that calendars in China date back to their earliest classic records, and traces the history of their calendars to modern times including extracts from those of the present day, which show a curious mixture of astrology, superstition and astronomy. Other popular articles are 'Shadows Cast by Starlight,' by Henry Morris Russell, and an account of the appearance of the 'The Stellar Floor' as seen through the clear steady atmosphere at Mt. Lorne Observatory, by Edgar L. Larkin; also a review of the Solar Observations of 1900, and a brief account by Dr. T. D. Anderson, the discoverer of Nova Persei, of his 'Searching for New Stars.'

SOCIETIES AND ACADEMIES.

SIXTH REGULAR MEETING OF THE BOTANICAL SOCIETY OF WASHINGTON.

THE sixth regular meeting of the Botanical Society of Washington was held at the Portner Hotel, March 29, 1902, with President A. F. Woods in the chair. At the conclusion of the business meeting, Mr. A. J. Pieters, chairman of the program for the evening, was called on to preside.

Professor A. S. Hitchcock discussed a peculiar specimen of short-leaf pine which he had observed. The tree had been girdled and had continued growing above the wound, so that